

REMARKS/ARGUMENTS

Status of Application

The Office Action objected to the drawings because they were allegedly unclear and hard to refer to. The Office Action rejected claims 1-3 under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the enablement requirement.

Applicant has submitted revised drawings and has added new claims 4-20. The revised drawings and the new claims do not add any new matter as they are fully supported by the specification, drawings, and claims as originally filed in this application, as well as Provisional Application Serial Number 60/426,669, filed November 12, 2002, which was fully incorporated by reference. (*See* Application ¶¶ 1 & 18.)

35 U.S.C. § 112 ¶ 1 Rejections

Pursuant to the first paragraph of 35 U.S.C. § 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

(emphasis added).

“It has been consistently held that the first paragraph of 35 USC 112 requires nothing more than objective enablement.” *Staehelin v. Secher*, 24 U.S.P.Q.2d 1513, 1516 (Bd. Pat. App. & Int. 1992) (citing *In re Marzocchi*, 169 U.S.P.Q. 367 (CCPA 1971)). “In satisfying the enablement requirement, an application need not teach, and preferably omits, that which is well-known in the art.” *Id.* (emphasis added) (citing *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 231 U.S.P.Q. 81 (Fed. Cir. 1986), *cert. denied*, 480 U.S. 947 (1987); *Lindemann*

Maschinenfabrik GMBH v. American Hoist & Derrick Co., 221 U.S.P.Q. 481 (Fed. Cir. 1984)).

“How such a teaching is set forth, whether by broad descriptive terminology, is of no importance since a specification which teaches how to make and use the invention in terms which correspond in scope to the claims *must* be taken as complying with the first paragraph of 35 USC 112 unless there is reason to doubt the objective truth of the statement relied upon therein for enabling support.” *Id.* (citing *Marzocchi*, 169 U.S.P.Q. at 369).

Moreover, “ ‘[i]t is well settled that the disclosure of an application embraces not only what is expressly set forth in words or drawings, but what would be understood by persons skilled in the art.’ ” *In re Howarth*, 210 U.S.P.Q. 689, 692 (C.C.P.A. 1981) (quoting *In re Chilowsky*, 108 U.S.P.Q. 321, 324 (C.C.P.A. 1956)). Hence, to satisfy the enablement requirement, the terms of the specification “need only be reasonable with respect to the art involved; they need not inform the layman nor disclose what the skilled already possess. They need not describe the conventional” and “[t]he intricacies need not be detailed ad absurdum. The skill of the inquiring artisan must be taken into account.” *General Elec. Co. v. Brenner*, 159 U.S.P.Q. 335, 337 (D.C. Cir. 1968). Accordingly, as the Supreme Court of the United States has explained:

If a mechanical engineer invents an improvement on any of the appendages of a steam-engine, such as the valve-gear, the condenser, the steam-chest, the walking-beam, the parallel motion, or what not, he is not obliged, in order to make himself understood, to describe the engine, nor the particular appendage to which the improvement refers, nor its mode of connection with the principal machine. These are already familiar to others skilled in that kind of machinery. He may begin at the point where his invention begins, and describe what he has made that is new, and what it replaces of the old. That which is common and well known is as if it were written out in the patent and delineated in the drawings.

Loom Co. v. Higgins, 105 U.S. 580 (1882) (emphasis added).

Finally, “[w]hen rejecting a claim under the enablement requirement of section 112, the PTO bears an initial burden of setting forth a reasonable explanation as to why it believes that the scope of protection provided by that claim is not adequately enabled by the description of the invention provided in the specification of the application; this includes, of course, providing sufficient reasons for doubting any assertions in the specification as to the scope of enablement.” *In re Wright*, 27 U.S.P.Q.2d 1510, 1513 (Fed. Cir. 1993).

The Office Action requested “new drawings and description to enable a person having ordinary skill in the art to understand.”¹ (Office Action p. 2.) However, enablement does not require simply that any “person having ordinary skill in the art” can make or use the invention, but rather that one “skilled in the art to which it pertains” may so do. This nuanced, but significant difference between 35 U.S.C. §§ 103(a) and 112 notwithstanding, as requested, Applicant has submitted revised drawings. Applicant has also corrected the placement of the lead line for element identifier 17 in FIG. 1 and has also added element identifiers 19 and 33. Applicant notes that no new matter is being introduced by these changes as the specification as filed clearly uses element identifier 17 to refer to the spacer block, element identifier 19 to refer to the block, and element identifier 33 to refer to the exhaust valve. (*See* Application ¶¶ 20, 22, & 23) Moreover, the specification also positions the spacer block 17 “between head 18 and block 19” and states that the “[s]pacer block 17 effectively lengthens cylinder 11 and allows the detonation tubes 13 . . . to be placed perpendicular to the travel of each piston 20.” *Id.* at ¶ 20.

¹ Applicant does not wish to belabor the technical nuances of patent law, but does wish to note that strictly speaking, the law does not require anyone, skilled or otherwise, to “understand” a disclosed invention, only that one skilled in the art could “make and use” the invention. Hence, it could be possible to satisfy the enablement requirement without providing a full “understanding” of the invention to even a skilled artisan. After all, a patent application is not, nor is required to be, a tutorial or pedagogical lesson that imparts wisdom, insight, or understanding to the reader.

Finally, FIG. 1 of the provisional application, incorporated by reference in this application, correctly identifies the spacer block (with element identifier number 5), the block (with element identifier number 7), and the exhaust valve (with element identifier 14). Hence, not only do these typographical changes to FIG. 1 not add any new matter, considering the specification and the provisional application drawings and disclosure, no one skilled in the art could possibly be confused as to what is being disclosed in FIG. 1.

The Office Action also requested a copy of the article entitled *Evaluation of a Hybrid Piston-Pulsed Detonation Engine*, AIAA 2002-0074, 40th Aerospace Sciences Meeting and Exhibit, Reno, Nevada (Jan. 14-17, 2002). This paper was part of the provisional application, which was incorporated by reference in this application. (See Application ¶¶ 1 & 18.) Nevertheless, as requested, Applicant has also attached another copy of this paper to the Declaration of Frederick R. Schauer, Ph.D, which accompanies this response.

The Office Action also indicates that the Examiner was “unclear about the structure of this invention.” (Office Action p. 2.) However, Applicant has submitted declarations “to show what one skilled in the art knew at the time of filing the application.” MPEP § 2164.05. Moreover, “[a] declaration or affidavit is, itself, evidence that must be considered.” *Id.* (emphasis in original). As the attached declarations illustrate, there can be little doubt that a person skilled in the art of pulsed detonation engines at the time of the filing of the provisional application, would have understood the structure of Applicant’s invention from this application and the incorporated references. Likewise, there is no evidence that a person skilled in the art at that time could not have been able to make and use Applicant’s invention. Simply put, all that one skilled in art would need is there.

For example, the structure of the invention is clearly set forth in not only the revised drawings, but is also shown and described in the drawings and the specification as originally filed. FIG. 1 shows a schematic cross sectional view of the hybrid piston pulsed detonation engine (PDE) of the present invention. FIG. 2 shows an assembly of a representative hybrid piston PDE. Both figures clearly show one or more detonation tubes 13. As shown in FIG. 1 and described in paragraph 19 of the specification, the “detonation tube 13 connects with each cylinder 11.” As shown in FIG. 2 and described in paragraph 20, a hybrid piston PDE will typically have a detonation tube 13 connected to and in communication with each cylinder 11 of the piston engine. Thus, as shown in FIG. 2, a four-cylinder engine will have four detonation tubes 13 connected to their respective cylinders 11. Finally, the spacer block 17, shown in FIGS. 1-3, lengthens the cylinder 11 and allows the detonation tubes 13 to be placed perpendicular to the travel of the pistons 20.

The Office Action also stated that “it seems like only a piston engine is shown” in FIG. 1. (Office Action p. 2.) However, as discussed, FIG. 1 clearly shows the detonation tube 13 connected to the cylinder 11. A traditional piston engine does not contain a detonation tube 13. Indeed, having such a tube 13 attached to a cylinder 11 would dramatically decrease the performance of a traditional piston engine, if not render it virtually useless. Internal combustible engine operate on the fundamental principle of creating an explosion, i.e., combustion, in a confined space, i.e, internal, or within the engine. Creating an aperture in a cylinder for the attachment of a tube 13, would allow for the dissipation of energy created by the exploding fuel. Hence, there would be less energy directed towards moving the piston, which is obviously the object of a traditional piston engine. Hence, if FIG. 1 shows only a piston engine, it is a piston engine that will certainly not work very well.

Of course, upon closer examination, FIG. 1 does indeed illustrate the Applicant's invention. Moreover, in light of the new drawings and the attached declaration, there can be little doubt that the Applicant's invention is fully enabled.


New Claims

Applicant has added new claims 4-20 to more particularly claim his invention. Applicant maintains that these claims, for the reasons discussed herein, are also fully supported and enabled by the application as originally filed and add no new matter.

Conclusion

In view of the forgoing remarks and attached declarations, Applicant believes claims 1-3 and new claims 4-20 are in complete condition for allowance and respectfully requests notice to that effect.

Respectfully submitted,



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Attachments

Amendments to the Drawings:

The attached sheets of line drawings FIGS. 1-6, 7a, and 7b, replaces the original sheets. In FIG. 1, the lead line for element identifier 17 has been corrected to now correctly identify the spacer block, and element identifier 19 has been added to identify the block, and element identifier 33 has been added to identify the exhaust valve.

Attachment: Replacement Sheets